Revision Topic – Watersheds and Aquatic Species

Need for Change

At the time the KNF and IPNFs Forest Plans were written (circa 1987), the emphasis was on developing a commodity production strategy while "minimizing" the impacts to watersheds and their aquatic resources. The strategies for watershed management were constructed in the Forest Plans essentially as "maintenance" objectives, but they lacked direction for proactive improvement or restoration of those resources. In some situations, thresholds, or "minimum impact" standards defined the criteria for maintenance. The 1987 Forest Plans, taken as a system of strategies and programs, were not designed to "restore" damaged water resources or watershed systems, or to protect those that were not impaired.

The Forest Plans rely on the application of Best Management Practices (BMPs) to ensure that watersheds and water resources are maintained during forest management activities. The adverse effects to soil and water quality have continually been reduced with the application and improvement of BMPs over time; but there continue to be impaired watersheds within the boundaries of KIPZ that do not fully support beneficial uses of the water.

In 1995, the Forest Plans were amended to include the Inland Native Fish Strategy (INFISH) (USDA 1995d). The implementation of INFISH gave greater protection to aquatic resources, especially riparian-dependent systems. INFISH was an interim measure intended to maintain and protect aquatic resources until a long-term strategy (presumably through Forest Plan Revisions) could be developed. While INFISH has led to improvement in the condition of aquatic resources by offering significant and more effective protections, the strategy falls short in some areas such as its focus on only certain priority watersheds, its focus on only part of the watershed (the riparian area - RHCA), and the default Riparian Management Objectives (RMOs) were developed for different conditions than those often occurring on the KIPZ meaning they may not be representative of these forests. In addition, although INFISH allows for and even encourages that watershed restoration be done, it lacks any specific direction or priority to do so.

Although the 1987 Forest Plans as amended by the INFISH strategy did not contain direction for watershed restoration, they also did not preclude it. Restoration has occurred in varying degrees over the years. BMPs, protections afforded by the implementation of INFISH, and increasing numbers of restoration projects have improved sites and even some tributary systems; however, more can be done with greater efficiency with restoration strategies in the Forest Plans focused on watershed systems.

Indications that the forests can more effectively contribute to aquatic elements related to ecological sustainability and that there is a need for increased restoration efforts include:

- Nearly a third of the sub-watersheds on or influenced by the two forests in the KIPZ have indications that their watershed condition is "Not Properly Functioning." Conversely, less than a quarter of the sub-watersheds appear to be "Properly Functioning." And, nearly half of the sub-watersheds, although currently properly functioning, exhibit trends or substantial risks that may move them into a "not properly functioning" category. This last category is termed "Functioning-At Risk." (Figure 1-25)
- Many stream segments, lakes, and other water bodies have been listed in the last ten years as "Water Quality Limited Segments" by the states of Idaho and Montana (Figure 1-26).
- Several fish and amphibian species on the forests are listed as threatened or endangered under Endangered Species Act (ESA), or as sensitive by the Regional Forester.
- There are conflicting priorities for limited restoration funds and resources. Forest Service, USFWS, and State Departments of Environmental Quality have different restoration priorities.

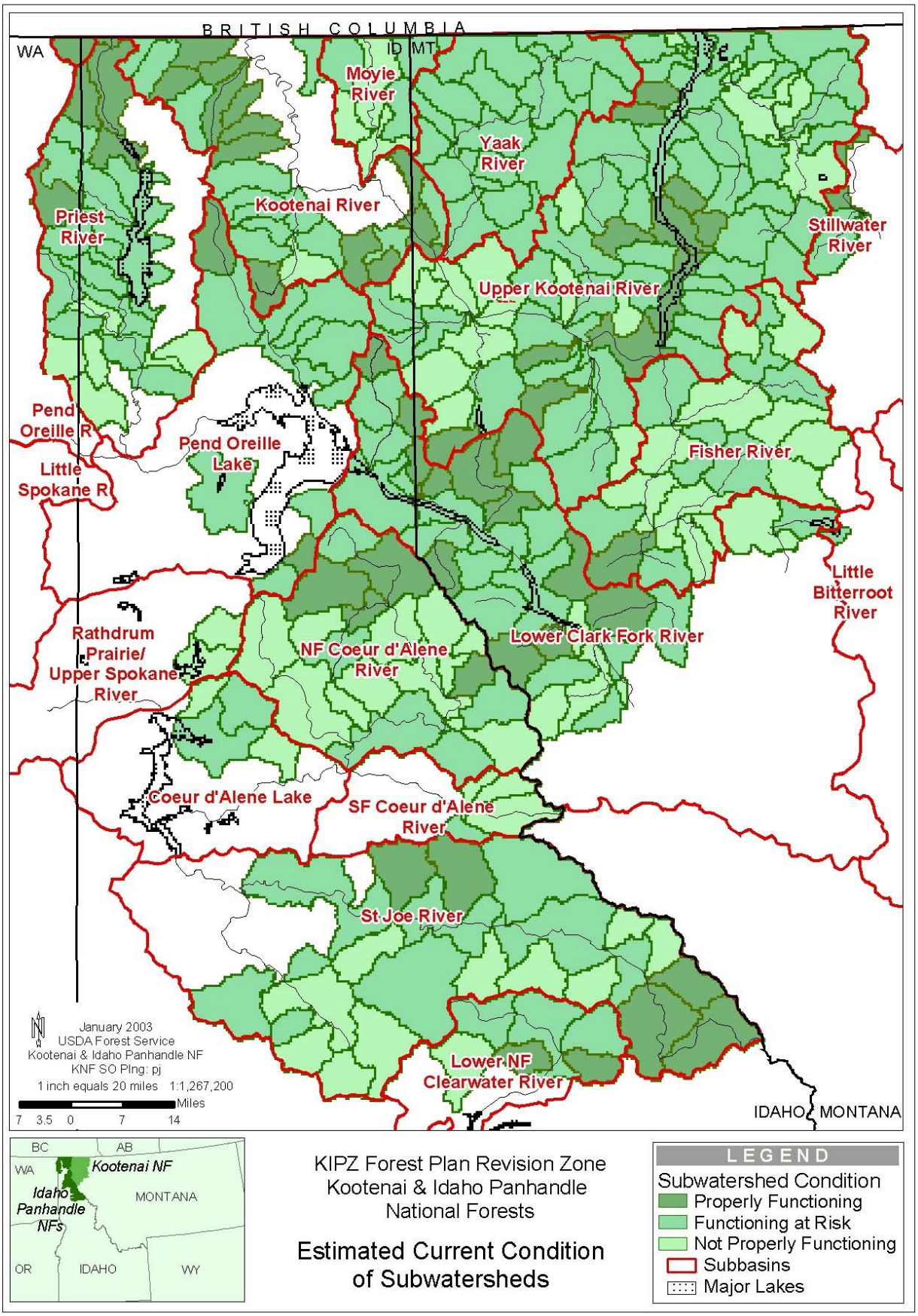


Figure 1-25: Estimated Current Condition of Sub-Watersheds on the KIPZ

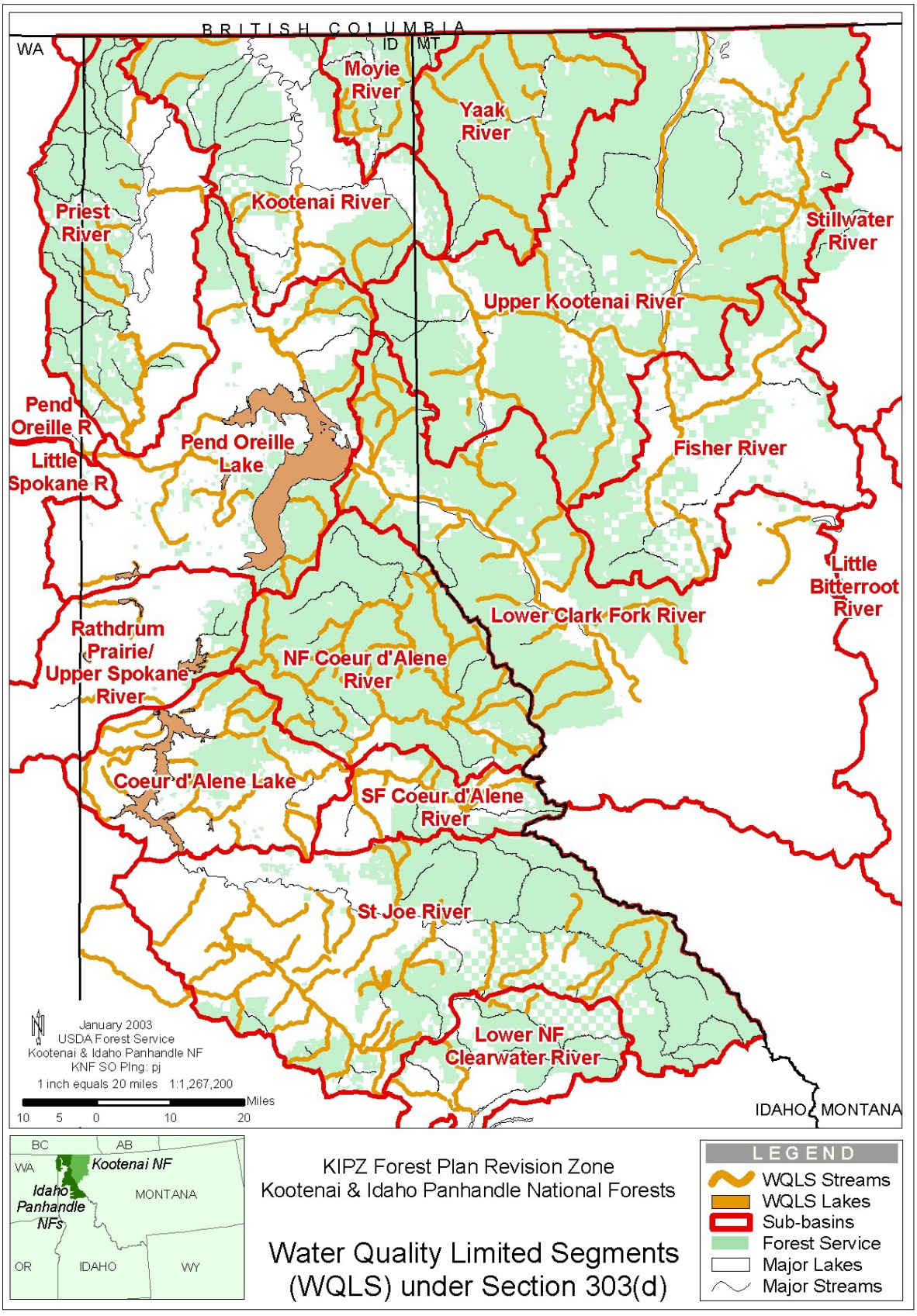


Figure 1-26: Water Quality Limited Segments (WQLS) listed under CWA Section 303(d)

Forest Plan Revision presents the opportunity to improve on past efforts (e.g., BMPs, INFISH) and to develop further direction for aquatic restoration. In addition, the revision process is a chance to integrate the KIPZ Forest Plans with other agencies' and groups' watershed restoration priorities and schedules. For instance, the priorities in the forests' mid-scale assessments (Geographic or Landscape Assessments) and the ensuing watershed restoration strategies often conflict with the State and EPA 303(d) and resulting TMDL plans and priorities. Other potentially conflicting strategies include national "large watershed" projects, State bull trout conservation plans, and westslope cutthroat trout conservation strategy Memorandum of Understanding (MOU) between Forest Service Region 1 and the state of Montana.

Forest Plan Revision provides an opportunity to resolve potential conflicts between aquatic restoration objectives and priorities and those of other resources. One example is the creation of grizzly bear core habitat, which has resulted in closures of roads that still have culverts and road prisms across sensitive land types. Since these roads are not maintained, there is an increasing risk of failures over time that would be detrimental to water quality and fisheries habitat. However, entering these closed roads to remove culverts and unstable roadbeds could lead to a temporary reduction in grizzly bear core habitat.

Laws and Regulations for Watershed

Clean Water Act The Federal Water Pollution Control Act, or Clean Water Act, is the principal law concerned with polluting activity in the nation's streams, lakes, and estuaries. Originally enacted in 1948, it has been revised by amendments in 1972 (P.L. 92-500) that gave the Act its current form and spelled out ambitious programs for water quality improvements that are now being put in place by industries and cities. Congress refined these amendments in 1977 (P.L. 95-217) and 1981 (P.L. 97-117). The 1987 amendments added:

- A new Section 319 to the Act, under which states were required to develop and implement programs to control nonpoint sources of pollution, or rainfall runoff from farm and urban areas, as well as construction, forestry, and mining sites.
- Section 303(d) of the Clean Water Act is of particular concern to the KIPZ planning effort. It requires states to identify pollutant-impaired water segments and develop "total maximum daily loads" (TMDLs) that set the maximum amount of pollution that a water body can receive without violating water quality standards.
- A water quality classification of streams and lakes to show support of beneficial uses.
- Antidegradation policies that protect water quality and stream conditions in systems where existing conditions exceed standards.

Organic Administration Act states that the mission of national forests is to "…provide favorable conditions of water flow…"

National Forest Management Act requires resource sustainability and monitoring.

In the *Multiple-Use Sustained-Yield Act* of 1960 (MUSYA), Congress again affirmed the application of sustainability to the broad range of resources over which the USDA Forest Service has responsibility. MUSYA confirms the USDA Forest Service's authority to manage the national forests and grasslands "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes," (16 U.S.C. § 528), and does so without limiting the USDA Forest Service's broad discretion in determining the appropriate resource emphasis or levels of use of the lands of each national forest and grassland.

NFMA (1982 Planning Rule, Sec. 219.23 Water and Soil Resource)

Forest planning shall provide for:

(a) General estimates of current water uses, both consumptive and non-consumptive, including instream flow requirements within the area of land covered by the Forest Plan;

(b) Identification of significant existing impoundments, transmission facilities, wells, and other man-made developments on the area of land covered by the Forest Plans;

(c) Estimation of the probable occurrence of various levels of water volumes, including extreme events, which would have a major impact on the KIPZ;

(d) Compliance with requirements of the Clean Water Act, the Safe Drinking Water Act, and all substantive and procedural requirements of Federal, State, and local governmental bodies with respect to the provision of public water systems and the disposal of waste water;

(e) Evaluation of existing or potential watershed conditions that will influence soil productivity, water yield, water pollution, or hazardous events; and

(f) Adoption of measures, as directed in applicable Executive orders, to minimize risk of flood loss, to restore and preserve floodplain values, and to protect wetlands.

Forest Service Manual Direction (Policy): The Forest Service manual contains direction to maintain and improve watersheds by using an integrated approach to identify specific watersheds as a priority for protection and management and for improvement.

Executive Orders 11514, 11988, and 11990 apply to floodplain management and wetland protection: The objectives of these orders are:

- To reduce risk of flood loss.
- To minimize impacts of floods on human safety, health, and welfare.
- To minimize destruction, loss, and degradation of wetlands.
- To preserve and restore the natural and beneficial values of floodplains and wetlands.

Laws and Regulations for Aquatic Species (Fisheries and Amphibians)

The Endangered Species Act (ESA) (1973) as amended: Section 7(a)(1) supports biotic sustainability by requiring that, "All…Federal agencies shall …utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species…"

Section 7(a)(2) of ESA includes direction that Federal agencies, in consultation with the United States Fish and Wildlife Service, will not authorize, fund, or conduct actions that are likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitat.

Similarly the *National Forest Management Act* (NFMA) (1976) directs the Forest Service to manage for a diversity of habitat to support viable populations (36CFR219.19). Regulations further state that the effects on these species and the reason for their choice as management indicator species need to be documented (36CFR219.19(a)(1).

The 1969 *National Environmental Policy Act* (NEPA) requires analysis of projects to insure the anticipated effects upon all resources within the project area are considered prior to project implementation (40CFR1502.16).

The recreational value of aquatic biota is acknowledged by *Executive Order 12962* (June 7, 1995) states objectives "to improve the quantity, function, sustainable productivity, and distribution of U.S. aquatic resources for increased recreational fishing opportunities by: (h) evaluating the effects of Federally funded, permitted, or authorized actions on aquatic systems and recreational fisheries and document those effects relative to the purpose of this order". (Recreational fisheries are discussed in the Recreation and the Social and Economic sections.)

Finally, *Forest Service Manual Direction (Policy)* contains direction on species and habitat management that supports recovery of listed species and maintenance of viable populations on NFS lands.

Forest Service Strategic Plan

Goals of the Forest Service Strategic Plan (USDA 2000a) as it relates to aquatic sustainability include:

Goal 1 "Ecosystem Health" states: "Promote ecosystem health and conservation using a collaborative approach to sustain the Nation's forests, grasslands and watersheds."

> *Objective 1.a states*: Improve and protect watershed conditions to provide the water quality to support ecological functions and intended beneficial water uses.
>
> *Objective 1.b states:* Provide ecological conditions to sustain viable populations of native and desired nonnative species and to achieve objectives for Management Indicator Species (MIS)/focal species.

Goal 2 "Multiple Benefits to People" states: "Provide a variety of uses, values, products, and services for present and future generations by managing within the capability of sustainable ecosystems."

The Forest Plans and Monitoring and Evaluation

Idaho Panhandle Forest Plan

Forest Plan monitoring and evaluation supports the need for restoration strategies. The "Summary of findings from Forest Plan Monitoring for 1988 through 1998" (USDA 1998b) concluded the following:

- Many highly roaded watersheds continue to produce sediment, which affects water quality and fish habitat.
- Bull trout and westslope cutthroat trout have become concerns.
- The forest has adopted a management philosophy based upon ecosystems with major emphasis on the restoration of those ecosystems.

Ecosystem restoration activities described in the Forest Plan Monitoring and Evaluation Reports (and as identified in the scientific assessment of the Interior Columbia River Basin) include broad restoration actions. One example would be to restoring watershed function and aquatic habitats to provide a connection between aquatic strongholds (existing populations of native fish species) (USDA Forest 1998b, 2000f, 2002c).

Kootenai Forest Plan

The 1987 Forest Plan directs the Forest to monitor for the effects of implementing the Forest Plan. The monitoring objective is to determine whether plan implementation maintains the aquatic environment to the degree that it will continue to support beneficial uses. Monitoring items specific to aquatic resources are listed below and more complete information can be found in the KNF Forest Plan (USDA 1987a, Volume 1, pps. IV-6 thru IV-13):

- Provide habitat capable of supporting recovered populations of T & E species, and cooperate in recovery efforts (C-7),
- Ensure that the intent of riparian management goals are met (C-9),

- To assure that changes in fish habitat and numbers do not exceed those predicted (C-10),
- To determine if Regional and project Soil & Water Conservation Practices are adequate to meet State water quality standards (F-1),
- To determine sediment impacts on water quality and fishery habitat (F-2),
- To determine the cumulative level of water yield increases and the resultant effect on stream channels (F-3),
- To determine changes in site quality due to surface displacement and soil compaction (F-4).

Monitoring item C-7 relies heavily on information gathered by other agencies associated with the Recovery Plans for T & E species. This item consists of compiling other information sources and incorporating that information into the annual monitoring Report.

Items C-9 and F-1 document the level to which the forest implements INFISH and BMP standards respectively. These items show a very high compliance with Forest Plan direction in this area; however, there is no way to determine effectiveness with regard to watershed condition. Item F-1 shows a high degree of onsite effectiveness but there is no documentation as to how that translates into overall watershed condition.

Items C-10 and F-2 have long been identified as inconclusive with regard to meeting their intended purpose. The standing recommendation for these two items is that they be modified into one item, C-11, that focuses on validation monitoring capable of identifying trends in the aquatic condition.

Item F-3 has shown that water yield in some surveyed watersheds has exceeded Forest Plan guidelines due to many factors since 1988.

Item F-4 has shown that detrimental disturbance within harvest units has been consistent with Forest Plan Guidelines.

Watershed Setting and History

Plate tectonics, volcanism, glaciation, weathering, erosion, and sedimentation processes over the past 1.5 billion years have resulted in the present mountain ranges, river courses, and watershed divides that characterize the KIPZ. Drainages have been designated as Hydrologlic Unit Codes (HUCs) according to their relative size. As shown in figure 1-27, a Sub-basin is a HUC4, watersheds are HUC5 and sub-watersheds are HUC6 (Figure 1-27).

Water, sediment, solutes, and organic material derived from hillslopes and their vegetative cover flow into and through streams and rivers. The shape and character of stream channels constantly and sensitively adjust to the flow of these materials by adopting distinctive patterns such as pools and riffles, meanders, and braids (Leopold et al. 1964). The vast array of physical channel characteristics, combined with energy and material flow, provides diverse habitats for a wide variety of aquatic and riparian dependent species.

The varied topography within the KIPZ, coupled with the irregular occurrence of channel-affecting processes and disturbance events such as fire, debris flows, landslides, drought, and extreme floods, results in a mosaic of river and stream conditions that is dynamic in space and time under natural conditions (Reeves et al. 1995). The primary consequences of most of these disturbances are to directly or indirectly provide large pulses of sedimentation and wood into stream systems. As a result, most streams and rivers in the KIPZ probably undergo cycles of channel change on a timescale ranging from years to hundreds of years in response to episodic inputs of wood and sediment. Many aquatic and riparian species are dependent on the dynamic nature of stream channels (Federal Register, 2000).

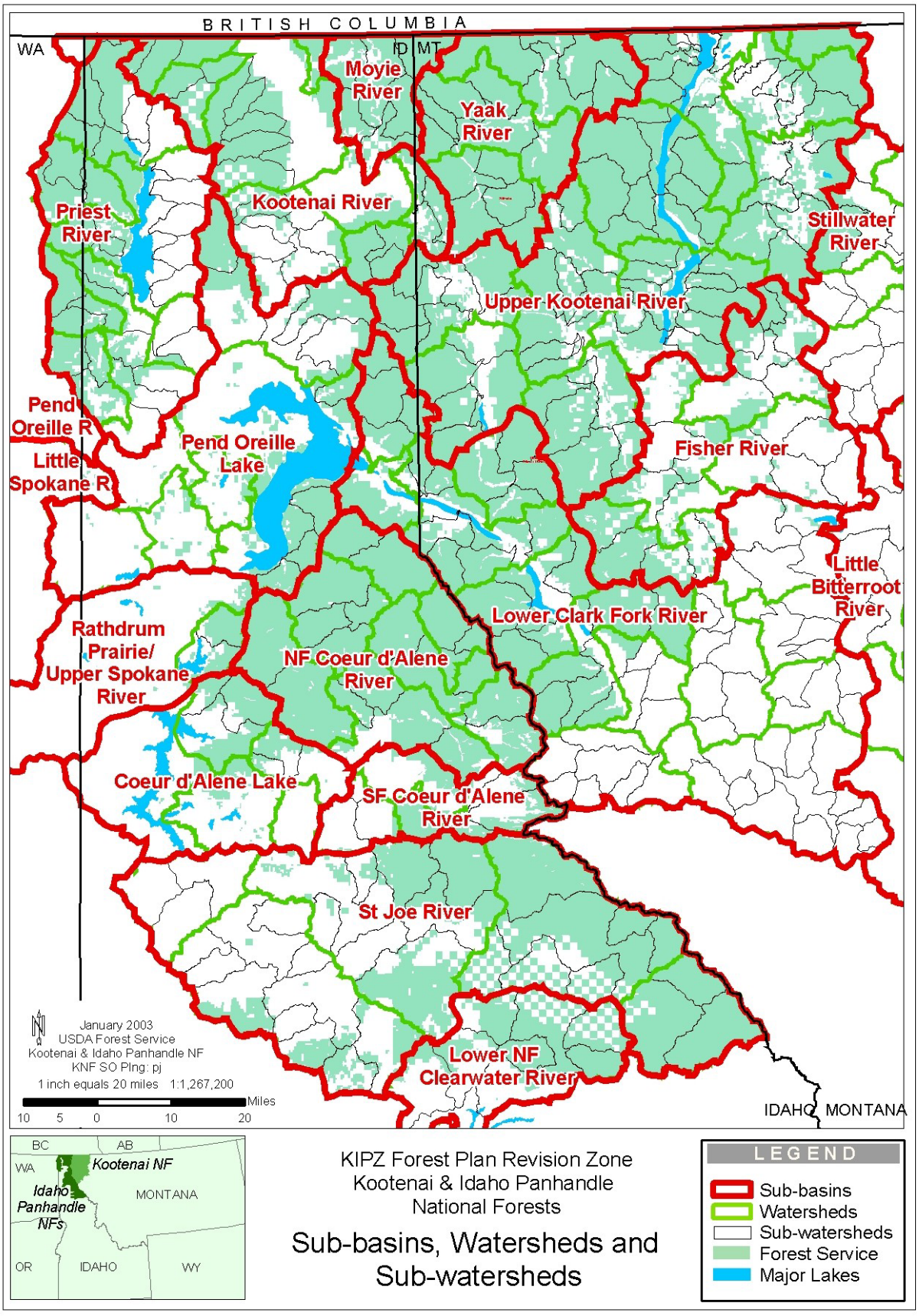


Figure 1-27: Sub-basins (4th-code HUCs), Watersheds (5th-code) and Sub-watersheds (6th-code)

All of the streams in the KIPZ eventually are tributary to the Columbia River. The major sub-basins within the KIPZ are the Upper Kootenai River, the Lower Clark Fork and Pend Oreille River, the St. Joe River and the Coeur d'Alene River that are the source for the Spokane River, and the Little North Fork of the Clearwater River (a Snake River tributary). Most surface runoff is a result of annual spring peak discharges caused by melting snow. However, the KIPZ is affected by distinct marine influences from the Pacific coast, where warm moist air masses often invade the region during the winter. This sometimes results in rapid snowmelt augmented by rain leading to sharp mid-winter peak flows.

Planning Questions for Watersheds and Aquatic Species

Planning questions have been developed to provide context to this revision topic. These questions are followed by a description of the historic and current conditions and form the baseline to compare the effects of the alternatives. Additional analysis will be completed for the DEIS to more fully address these questions. This information will provide the decision maker with the knowledge necessary to understand the issue and make a decision.

For the KIPZ Forest Plan Revision, aquatic sustainability is based on two primary components: (1) watershed condition and integrity, and (2) aquatic biota condition and integrity. These two assessments will be combined to estimate aquatic sustainability conditions for all 6th level watersheds (HUC 6) across the KIPZ. This approach combines the physical characteristics of watersheds with the biological communities that are dependant on them. Both components are essential to sustain aquatic resources.

Planning Question – What are the historic and current conditions of the watershed systems, and what are trends of the watershed conditions?

Historic and Current Condition of Watersheds

The watershed systems in the inland northwest evolved over millions of years under the influence of many forces and processes. But the character and resiliency of the systems were honed and the climate and geological processes following the last ice age, about 10,000 years ago. Since then the watershed systems have been subject to a wide array of disturbances and events. These disturbances have often been intense and cyclic in nature and may appear to recur somewhat randomly, but with predictable frequency. The watersheds and their dependent resources have evolved under this "pulse" disturbance regime so that they can effectively respond to those disturbances over time while sustaining their long-term functions, processes, and condition.

Around the beginning of the 20th century, the influx of human populations began in the inland northwest along with the development of the land and resources to support those populations. This has resulted in many new disturbances to the watershed systems; and the pattern of many of those disturbances has tended to be a more sustained or "press" disturbance regime. Many of those disturbances tend to mimic historic "natural" processes, but the frequency and intensity has been greatly amplified. In some cases, the watershed systems have begun to radically adjust to those press disturbances, or have become altered by them; resulting in severe stresses in their capability to support dependent resources.

Within the KIPZ, human activity has extensively altered stream channels by direct modification such as canalization, wood removal, diversion, dams, log drives, and encroaching structures such as roads, railways, bridges, and culverts. Humans have also indirectly affected the incidence, frequency, and magnitude of disturbance events. This has affected inputs and outputs of sediment, water, and vegetation. These factors have combined to cause pervasive changes in channel conditions throughout many parts of the KIPZ, resulting in aquatic and riparian habitat conditions measurably different from those that existed prior to human development. Natural (primarily wildfire) and human-caused (timber harvest and road construction, mining, dams, introduction of non-native species, recreation, and grazing) disturbances over

the last century have led to changes in the physical watersheds and in the fish and amphibians dependent on them (Lee et al. 1997).

Roads can have some of the greatest effects to watersheds and aquatic biota. Roads can change the runoff characteristics of watersheds, increase erosion and sediment delivery to streams, and alter channel morphology (Furniss et al. 1991). These direct effects lead to changes in habitats for fish and amphibians. Roads also often fragment the habitat of these animals, and may be a significant cause of death for migrating amphibians. Although current BMPs for road construction are designed to minimize the damage to watersheds, many miles of road existing on the landscape were not built to these standards or are no longer maintained. As a result, these roads either continue to degrade watersheds through chronic erosion or are at risk for mass failure from crossings or locations on sensitive landtypes.

Approximately 168 stream segments or water bodies on the two forests have been listed by the States of Idaho and Montana as impaired under section 303(d) of the Clean Water Act (as of Nov. 2002, 123 on the IPNFs and 45 on the KNF). Impaired water bodies are described in subsection 303(d) of the Clean Water Act as water quality (including stream conditions) that do not meet State water quality standards, which is a broad term that includes water quality criteria, designated uses, and antidegradation policies (Figure 1-26 at the beginning of this section).

The primary watershed unit (hydrologic unit) upon which watershed condition and management response has been assessed is the 6th-code HUC (hydrologic unit code) or "sub-watershed." The watershed condition classifications are described in the following section. Based on watershed analyses and geographic assessments conducted on both Forests, the expected or apparent watershed condition of the sub-watersheds are summarized in the following table and in Figure 1-25:

Table 1-22: Distribution of Expected Watershed Condition by Sub-Watershed

	Idaho Panhandle National Forest	Kootenai National Forest
Number of sub-watersheds	122	144
Watershed Condition		
Properly Functioning Condition	26%	17%
Functioning, At-Risk	46%	61%
Not Properly Functioning	28%	22%

Methods to Determine Watershed Condition and Trend

The concepts of watershed condition are consistent with those defined in the Proposed Unified Federal Policy for Ensuring a Watershed approach to Federal Land and Resource Management (2000g). These will be used to indicate the status and trend of the watershed based on:

- Physical characteristics and processes (e.g., hydrologic, geomorphic, landscape, topographic, vegetative cover, and aquatic habitat)
- Water flow characteristics and processes (e.g., volume and timing), and
- Water quality characteristics and processes (e.g., chemical, physical and biological), as it affects water quality and water resources.

A variety of physical measures that reflect the inherent (i.e., natural) sensitivity and resiliency of watersheds, combined with measures based on human-caused disturbance histories of those watersheds will be assessed at the sub-watershed (6^{th}- code hydrologic unit) scale. The measures focus on the slopes (the land system), the riparian areas, and the streams and lakes within the watershed. This information will then be further refined using additional field measurements, monitoring, and professional judgment based on scientific principles to determine the condition of each 6^{th}-code watershed, i.e., whether it is:

- In properly functioning condition;
- Functioning at risk; or
- Not properly functioning.

Watersheds in **"properly functioning condition"** (*PFC*) are essentially in good condition in terms of physical, hydrologic, and water quality characteristics and function. PFC watersheds have generally high integrity in terms of those same characteristics and processes. The streams are in dynamic equilibrium with their watersheds (i.e. they adjust appropriately to natural fluctuations of stream flow and sediment loading), and the watershed systems are fully functional, operating within their potential. The systems are adjusting to disturbances within their apparent natural ranges of variability; and they can be expected to respond to disturbances with a trend toward a good condition within a reasonable time period.

Watersheds that are **"functioning at risk"** (*FAR*) continue to have adequate physical, hydrologic and water quality integrity; however, present or ongoing adverse disturbances are likely to compromise that integrity if the present adverse disturbances are not modified or corrected. FAR watersheds have at least moderate physical, hydrologic, and water quality integrity even though they may have been substantially compromised by adverse disturbances.

Watersheds that are **"not properly functioning"** (*NPF*) are operating and adjusting outside what can be considered dynamic equilibrium; or the physical, hydrologic, or water quality integrity has been so compromised that restoration efforts may be difficult without significant funding and very long recovery time periods. Watershed systems that are NPF are essentially not physically capable of fully supporting beneficial uses. These systems will likely require substantial intervention and/or extremely long recovery periods to restore their capability to fully support beneficial uses. They may contain aquatic resources that are seriously degraded or that are not likely to sustain themselves over time.

Planning Question – What are the historic and current conditions of the aquatic species, and what are the trends?

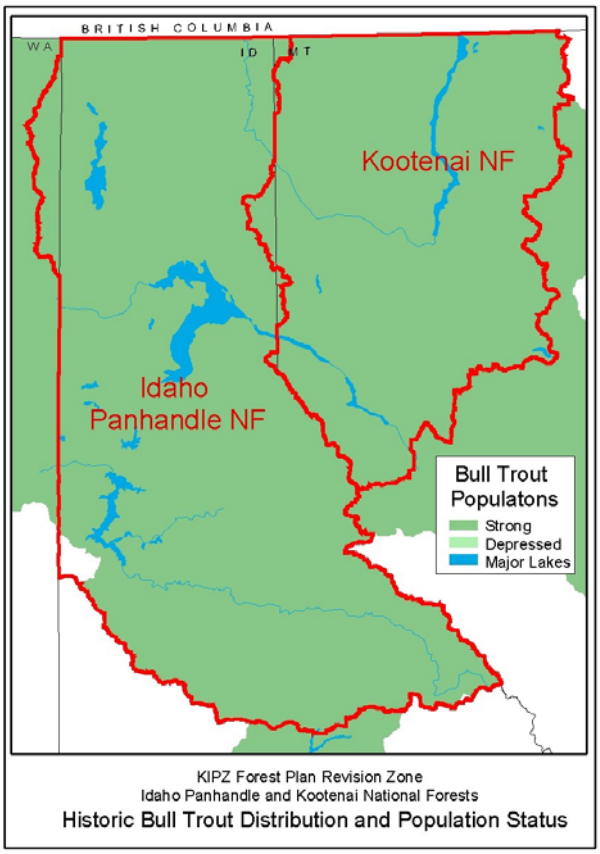
Historic and Current Condition of Aquatic Species

Species distribution and abundance have changed dramatically from historic conditions. There are indications that those historic distribution and abundance shifts have continued during the term of the 1987 Forest Plans; however, the rates of change may have been somewhat tempered with improved protection practices including the INFISH amendments.

While there are many known and unknown causes for this, changes in the physical environment and the subsequent habitat alteration have been the main contributors. The following are general statements about the current conditions of some native fish and amphibian species in the KIPZ. There are six fish species and three amphibian species on the KIPZ listed as threatened or endangered under ESA, or that are on the Regional Forester's Sensitive Species list. Their appearance on these lists indicates the overall viability of these species at risk. Two fish species (bull trout and westslope cutthroat trout) are also listed as Management Indicator Species (MIS) in the 1987 IPNFs Forest Plan.

Fish

Bull trout: Bull trout are listed as Threatened under ESA. According to Lee et al. (1997), they are widely distributed across the Columbia River Basin, although their estimate current range is about 60% of the historic range. This species is in widespread decline and many local extirpations have occurred across their range. Important strongholds include the Upper Clark Fork Ecological Reporting Unit (ERU), Northern Glaciated Mountains ERU, and Lower Clark Fork ERU on the KIPZ. Watersheds that are currently predicted to be strong spawning and rearing areas represent six percent of the historic range. Migratory life histories have been lost or limited throughout the range.



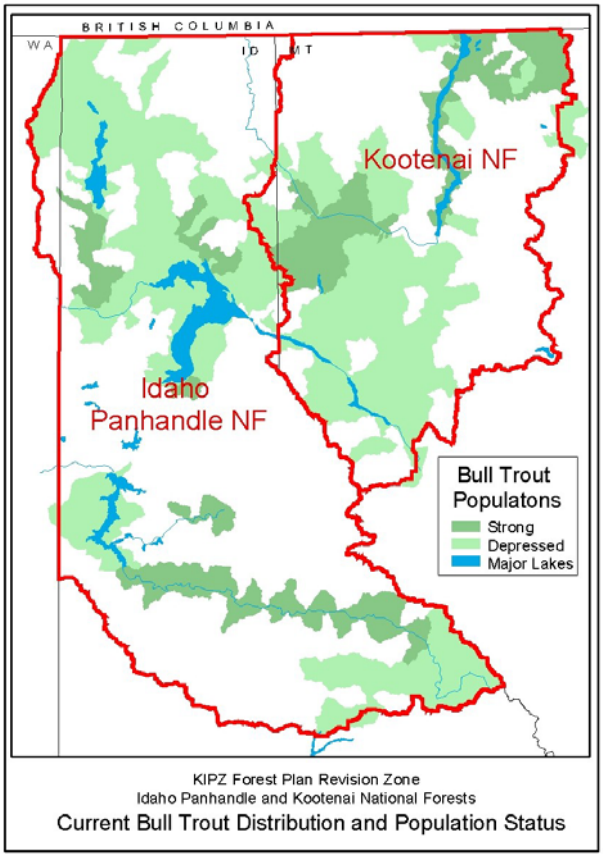


Figure 1-28 (left): Probable bull trout historic range (from Lee et al. 1997)
Figure 1-29 (right): Current bull trout distribution and population status

Westslope cutthroat trout: This subspecies of cutthroat trout is on the Regional Forester's Sensitive Species list. This subspecies was petitioned for listing under ESA, although listing was determined to be "not warranted" by the U. S. Fish and Wildlife Service. It is currently going through a court ordered status review. Westslope cutthroat trout are still widely distributed but remaining populations may be seriously compromised by habitat loss and genetic introgression (Lee et al. 1997). This subspecies is estimated to occur in 11% of its historic range in Idaho (Rieman and Apperson 1989), and 27% of its historic range in Montana, although genetically pure populations occur in only 2.5% of its Montana historic range (Liknes and Graham 1988). However, Lee et al. (1997) estimated that westslope cutthroat trout still occupy 80% of its historical range of the Montana portion of the Interior Columbia River Basin, although they agree there are few strong populations remaining.

Most of the populations on the KIPZ are depressed. Migration barriers (dams, irrigation diversions, other) have isolated or eliminated habitat once available to migratory populations. Small often isolated populations persist throughout the range, but the long-term outlook for many of these populations is poor. The core of strong populations is associated with the Central Idaho Mountains ERU (not in KIPZ). The Upper Clark Fork and Northern Glaciated Mountains ERUs (in KIPZ) are important regions, but are more fragmented and restricted to a relatively smaller portion of the historical distribution (Lee et al. 1997).

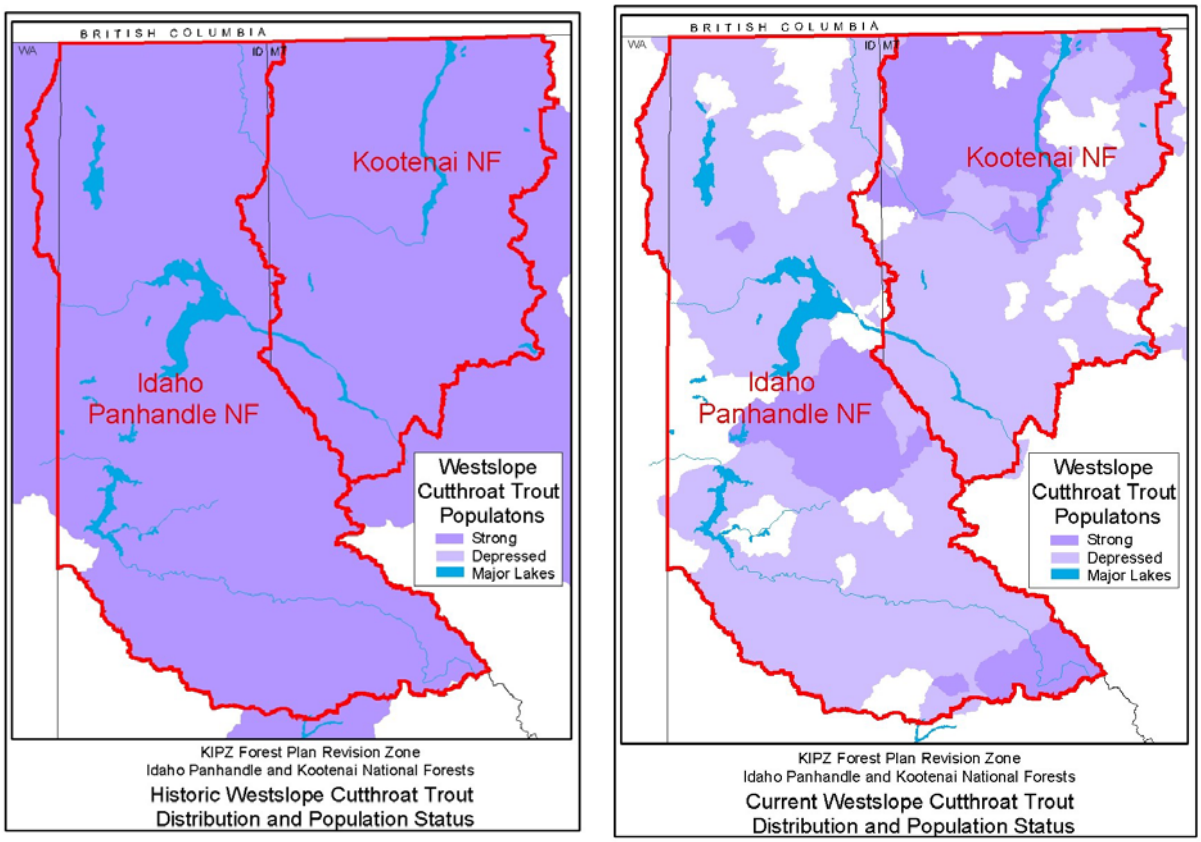


Figure 1-30 (left): Probable historic westslope cutthroat trout distribution (Lee et al. 1997)
Figure 1-31 (right): Current westslope cutthroat trout distribution and population status

Interior Redband Trout: Interior redband trout are on the Regional Forester's Sensitive Species list. The allopatric form (i.e., not found in the same areas as steelhead trout) of interior redband trout is found on the KIPZ. Historically, this was the most widely distributed salmonid in the Columbia River Basin, although it was not widespread on the KIPZ. Current populations on the KIPZ range from strong to depressed. Hybridization and competition are its main threats.

Torrent Sculpin: Torrent sculpin is on the Regional Forester's Sensitive Species list. Little is known about this species, including its historic distribution. Major risk factors are believed to be pollution, increased water temperatures, and sedimentation (Lee et al. 1997). A study is currently underway on the IPNFs that is designed to generate distribution and habitat information.

Burbot: Burbot, also known as ling cod, are listed as a sensitive species by the Regional Forester, and has been petitioned for listing under ESA. This species is found only in the Kootenai River on KIPZ. This

population is very depressed from historic levels. Changes in hydrologic flows caused by Libby Dam are the biggest threat to this population.

Kootenai River White Sturgeon: Kootenai River white sturgeon are listed as Endangered under ESA. This species is restricted to 695 river kilometers of the Kootenai River. These fish have not successfully spawned in recent years. Changes in flows from Libby Dam are the biggest threat to population. Land management activities are considered a secondary impact to populations of this species (Lee et al. 1997).

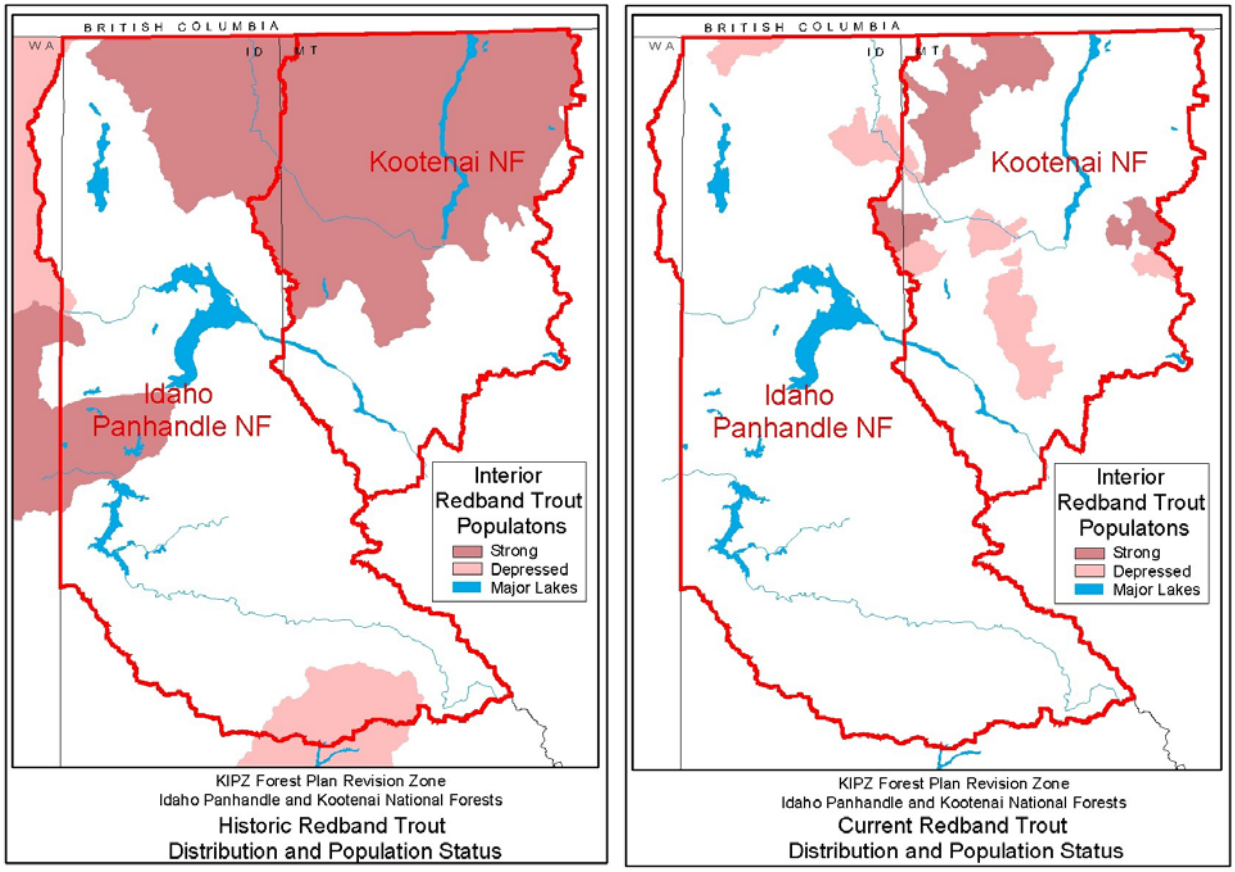


Figure 1-32 (left): Probable interior redband trout distribution (from Lee et al. 1997)
Figure 1-33 (right): Current interior redband trout distribution and population

Amphibians

Each of the following amphibians are listed as sensitive by the Regional Forester:

Boreal Toad: This species is in widespread decline throughout its range for unknown reasons. The species was once common and widespread in Western Montana, but now is uncommon and local. Direct measures of population trend on the Kootenai are not available. Incidental breeding occurs on IPNFs. Although historic distribution is largely unknown; this species has occurred at Priest Lake Basin, Priest River below Priest Lake, Cocolalla Creek, Lower Coeur d'Alene River, and Little NF Clearwater River on the IPNFs. Past land management activities (timber harvest and road construction) in and near streams and wetlands have likely resulted in habitat loss. Because of the species' specific habitat association, and the number of unoccupied historical sites, it is possible that populations have declined or even been extirpated locally. Migration barriers, especially roads, have isolated habitats, probably impacting reproduction and/or winter survival. Mortality from road traffic may be significant near breeding ponds.

Coeur d'Alene Salamander: This species is endemic to the IPNFs, northwest Montana, northeast Washington and southern British Columbia. On the IPNFs, it has been found on the St. Joe watershed. The population size on the KNF is unknown. Cassirer et al. (1994 pg. 52) reported thirteen Coeur d'Alene salamander sites on the KNF. Werner and Reichel (1994 pg. 9 and 1996 pp. 65-58) show additional sites. Past land management activities, timber harvest and road construction in and near streams have likely resulted in habitat loss. Because of the species' specific habitat association, it is possible that populations have declined or even been extirpated locally.

Northern Leopard Frog: This species is declining across the U.S. Widespread extirpations are known from Alberta, Wyoming, Colorado, Washington, Idaho, and Oregon. The decline is possibly due to habitat loss and collection for scientific study. Bullfrog and fish introductions, acid rain, ozone depletion, and immune system suppression have also been suggested as causes for frog extirpations. It is unknown if this species occurs on IPNFs, although they have been found on non-Forest land in northern Idaho counties. Albeni Dam flooded much historic habitat around Lake Pend Oreille in the early 1950s. Only one active site is known on the KNF, although there is historical evidence of this frog at five additional locations. The historic distribution of this species is largely unknown.

Methods to Determine Condition and Trend of Aquatic Biota

Habitat and population information will be analyzed for native and desirable non-native aquatic species. In addition, biological significance and habitat connectivity will be determined for native species. An assessment of this data, combined with additional field measurements, monitoring, and professional judgment based on scientific principles will be used to determine the condition and trend of aquatic biota at the 6th- code watershed (HUC 6) scale. This information will then be integrated with the watershed condition findings to aid in answering the Planning Questions.

In this part of the assessment, strategies will be developed to maintain and protect properly functioning areas and to restore those areas that are not, thereby improving the KIPZ contribution to aquatic sustainability. Other factors will be integrated, including non-Forest Service agency restoration priorities (e.g., State and EPA TMDL plans and priorities, national "large watershed" projects, State bull trout conservation plans, and westslope cutthroat trout conservation strategy MOU between Forest Service Region 1 and the state of Montana), as well as a determination of feasibility of restoration, to aid in setting restoration priorities for aquatic systems.

Priorities for aquatic restoration will then be integrated with other resource priorities (likely during analysis at the watershed [EAWS] scale) to further refine management direction.

Planning Question – What are the implications of continuing under current management direction for Watersheds and Aquatic Species?

Legacy effects from past timber harvest, mining, and other human-caused disturbances continue to effect watershed condition and health. The 1987 Forest Plan direction, as amended by INFISH (USDA 1995d), reduces the risk to watersheds and aquatic biota from new and ongoing activities. For some resources, INFISH standards and guidelines contain general direction for repairing past damage (roads, grazing, recreation), although it is lacking for other resources (timber harvest, mining). Generally, under the direction of the 1987 Forest Plans, the intensity and the risks associated with new and ongoing developments and man-induced disturbances has been and will be greatly reduced as compared to the last several decades. However, they are likely to continue to accumulate, and the press-nature of those disturbances still exists.

The extent and distribution of legacy disturbances is not likely to be effectively reduced on a watershed scale. Certainly, there will continue to be local improvements; but watershed-scale improvements will progress slowly and perhaps haphazardly. Without specific direction and emphasis in the Forest Plan, watershed restoration may tend to be prioritized and directed by more visible developmental and commodity-based resource decisions.

Current condition and trends show that native aquatic species are in decline. Land management practices, particularly historic practices, while not the only cause (introduction of non-native species, influence of hatchery fish, and harvest are other contributing causes), have had major influences. Under the current direction, some areas will likely see a slow improving trend, others will continue to chronically degrade, and the viability of native species will continue to be at risk.